E-learning in medical education
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A Virtual Learning Environment for Teaching Medicine –
experience from the University of Colombo, Sri Lanka

Context
The use of computing and the internet in education is known as Electronic Learning or, more typically, e-learning, and is fast becoming an important component of healthcare education (Ellaway and Masters, 2008). E-learning has several advantages over the traditional methods of medical instruction and assessment; e-learning makes learning more interactive, offers immediate and student-specific feedback, allows for individually tailored instruction, enables objective testing, and makes learning more entertaining.

E-learning is best delivered through a Virtual Learning Environment (VLE). A VLE is a computer based software system designed to support teaching and learning in an educational setting, i.e. school, university (Popat et al, 2007, Weller 2007). A VLE provides a wide collection of tools such as those for interactive learning, assessment, communication, uploading of content, return of students' work, peer assessment, administration of student groups, collecting and organizing student grades, questionnaires, tracking tools, etc. Originally created for distance education, VLEs are now used most often to supplement face-to-face teaching. VLEs allow instructors/teachers and learners/students to interact in an online community, without being present in the same physical location or time frame. The core of a VLE is a Learning Management System (LMS), which is a collective term used to describe a set of well configured, regularly monitored and centrally managed software tools designed to handle user learning interventions.

The Faculty of Medicine, University of Colombo is the oldest and largest medical faculty school in Sri Lanka. Ten years ago the Faculty switched over from a traditional teacher/discipline-based curriculum to an integrated module-based curriculum.

Activity
With the aim of supplementing and complementing face-to-face learning, a group of academics initiated a process in 2005 which eventually led to the establishment of a Virtual Learning Environment for the medical undergraduates of our Faculty. Three processes were initiated in parallel;

- physical infrastructure development with IT hardware resources,
- a Learning Management System,
- development of educational content (learning material).
A needs assessment was first performed through discussion with academics and students. The ability to interact within a virtual learning space was identified as a definite advantage, since large student numbers and limited space resulted in less than ideal student participation in small group teaching sessions. Repetition and reinforcement of traditional teaching sessions was desirable, in particular to overcome potential language barriers. The need to provide internet access and IT training to students was also considered. Expected outcomes were identified (making available online learning material, enhancing self learning, reinforcing and enhancing existing knowledge, enabling catch-up learning, improving IT skills, providing internet access). Some teachers had concerns that making lectures available online would reduce teacher-student interaction and also potentially increase the opportunity for plagiarism. Overall, however, the majority of teachers agreed that establishing a virtual learning environment to complement and supplement the conventional curriculum was a positive step towards enhancing learning.

A computer laboratory with 70 computers, a central server and a wireless network was established; this central hub was named the Virtual Learning Centre. The open source software Moodle® (www.moodle.com) was adopted to develop a Learning Management System. We chose Moodle over other commercial software packages, firstly because it is an open source, its features suit our needs, it is relatively simple to learn and configure yet extremely flexible and powerful. The authors developed an LMS which would enable students to log in, access resources categorized according to the teaching programs, manage activities, send feedback to teachers, and take part in assessments.

Taking the existing IT skills of teachers into account, we developed a 3-tier programme for production of e-learning material. Microsoft PowerPoint® was by far the commonest software used by teachers. The ideal solution we looked for was a method by which a teacher (content expert) with little technical IT knowledge could develop learning material meeting the expected objectives within a short space of time. The solution needed to have a rapid learning curve; production of a learning module should take relatively little time, yet the final results had to be of high quality. Hence the tiers, in ascending order of complexity were: (1) simple text and diagram-based static teaching material in an electronic book (e-book) format using Adobe® PDF, (2) Microsoft PowerPoint® presentations with additional explanatory text added, and (3) advanced interactive dynamic multimedia material – for this we adopted the package Articulate Studio® (www.articulate.com). This is an add-in to Microsoft PowerPoint which allows the user to enhance PowerPoint presentations with multimedia, add a synchronized voice-track, insert quizzes, and control navigation between slides. The package allows the user to convert the PowerPoint slideshow with a click of a button into a standalone, platform independent flash presentation, which can be then be easily integrated into a LMS. We conducted a series of workshops to train staff in the software; representative staff were selected from each department/unit for training; they in turn would train other staff in the faculty and hence creating a competency pool.

The Virtual Learning Centre was launched in May 2007, complete with an LMS, a large collection of interactive multimedia learning materials, and a virtual library. Operational guidelines were established to address issues of authenticity, ownership and responsibility and abuse. The VLE integrates with the existing curriculum by complementing face-to-face learning activities. Specific time slots for students have been allocated within the time table for students to visit the VLC and use the interactive learning material. A reusable learning objectives (RLO) repository and learning material production centre are to be established shortly.
Evaluation

A random survey of 100 students using the VLC facilities was performed. We found that the majority of students use VLC facilities for accessing the available learning material available on the VLE, for internet access, and for preparing reports for assignments. Nearly all students (99%) thought that the learning resources available in the VLC were useful. Enthusiasm among teachers to produce e-learning material is currently extremely high. The main limitation we face is staffing and the time to produce learning material in the midst of our busy schedule.

Conclusion

Our VLE was developed from the ground upwards, with minimum technical expertise - no IT professionals were involved - and the outcome has surpassed our expectations. The process followed could serve as an innovative model for other Universities and institutions, especially in developing countries.

References


Notes on Contributors

Senaka Rajapakse (Consultant Physician and Senior Lecturer in Medicine) and Deepika Fernando (Senior Lecturer in Parasitology) are responsible for development, administration, maintenance and academic aspects of the Virtual Learning Environment (VLE) of the Faculty of Medicine, University of Colombo. Nadun Rubasinghe and Suranja Gurusinghe were demonstrators who provided technical and academic input into the development of the VLE.

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This AMEE Guide Supplement was published in Medical Teacher 2009. 31:452–453.